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AUTHOR Belcher, Marcia J.
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ABSTRACT

A study was conducted at Miami-Dade Community College (MDCC) to examine the separate and combined effects of entering basic skills levels and curriculum-related variables (i.e., grades in required English and math courses, the length of time between the course and the test, and the number of credits in developmental courses) in predicting student competence in reading, writing, and mathematics after the equivalent of 2 years of college. The study population included all MDCC students who took a sophomore test of basic skills for the first time between fall 1984 and fall 1985. Based on ethnicity, three groups were formed, consisting of 241 Black non-Hispanic, 591 White non-Hispanic, and 1,401 Hispanic students. Entering levels of basic skills were measured using the Comparative Guidance and Placement Program test, while exiting skills levels were measured using the College Level Academic Skills Test. Study findings included the following: (1) White non-Hispanic students tended to have higher levels of entering basic skills, and slightly higher grades as well; (2) in predicting the exiting level of basic skills in computation, the curriculum was the strongest indicator of test performance, especially for Black non-Hispanic students; (3) in predicting exiting communication skills levels, especially in reading, entering basic skills alone and in interaction with curriculum weighed heavily; and (4) MDCC students experienced a "value-added" education that moved the students beyond the level expected from basic skills scores. (EJV)

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PREDICTING COMPETENCE IN BASIC SKILLS AFTER TWO YEARS OF COLLEGE: THE ROLES OF ENTERING BASIC SKILLS AND THE CURRICULUM

Marcia J. Belcher
Research Associate, Sr.
Miami-Dade Community College

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Predicting Competency in Basic Skills
After Two Years of College:
The Roles of Entering Basic Skills and the Curriculum

As the demand for accountability leaps from the public schools into higher education, rumblings of testing to demonstrate student competence have been heard with increasing frequency. Led by no less than William Bennett, Secretary of the Department of Education, much of the focus has been on value-added testing to show both competence and improvement through the college years. Proponents argue that grades do not show the student's level of competence in basic skills, and that grades (and a college diploma) do not show what students have gained from college. To quote a recent report on improving the quality of undergraduate education, "while grades and credits may be useful in reflecting the competence of students at the end of course, they do not necessarily reflect what students have actually learned and retained" (Study Group on the Conditions of Excellence in Higher Education, 1984, p.14).

Using the decline in SAT scores as evidence, some argue that an increasing number of students are entering college unprepared for college level work. There can be little argument that students who enter college lacking basic skills in reading, writing, and mathematics will have difficulty catching up with their better-prepared peers. Research on the public schools has shown that students who enter school deficient in basic skills fall further and further behind as they proceed from kindergarten to the twelfth grade. There are also an ample number of studies to show that aptitude scores such as the ACT and SAT predict freshman grade point average quite well, especially when combined with high school performance (e.g., Willingham, 1985; Linn, 1982; Donlan, 1984). This finding indicates that those who start on top, stay on top, at least to the end of the freshman year.

As students progress through college, however, this prediction wanes (Humphreys, 1968). Willingham (1985) proposed three hypotheses to account for the change: (1) the students' aptitudes changed, (2) the task changed, or (3) grading changed. Using his own study and previous research

by others, he concluded that student aptitudes and the task remained fairly constant, but that departmental fluctuations in grading, when combined with student selection patterns, could be the reason. This finding calls into question the integrity of cumulative grade point average while simultaneously reaffirming the importance of entering student academic characteristics.

Still, other influences must be considered. The role that time and memory play in weakening correlations, especially for specific content areas, may be important. In studies of test-retest reliability, the longer the lapse of time between the two administrations of the test, the lower the correlation is likely to be. At Northern Missouri State, implementation of a value-added testing program using the ACT COMP test revealed that students actually knew less mathematics at the end of their college career than when they entered, probably due to forgetting of high school mathematics concepts. Requiring students to take more math reversed this finding. A meta-analysis of programs for high-risk and disadvantaged students also indicated that such programs could improve grade point averages (Kulik et al., 1983). Such programs, if successful, might re-order the rankings of students between entry and exit and thereby lower the correlation.

The universally assumed but seldom tested belief is that students leave college knowing more than when they enter. In the case of subject area content, this conclusion seems obvious. Teachers teach students and then test them on the content of their lectures and tests and review other assigned projects meant to elicit students' grasp of the subject. Student course grades present a summary of these multiple measures of student performance. But what about the basic skills of reading, writing, and computation that students use so frequently in college but seldom receive specific instruction in after their first year or two in college? Do students leave college more able to perform in these areas, too? What role do the curriculum and entering basic skills play in this area? Can curricular interventions in skills development in English and math break the link between entering and exiting level of basic skills in the first years of a student's college experience? To date, little effort has been put forth to answer this form of the question of value-added.

Purpose of the Study

The purpose of this study was to begin to pull apart the separate and combined effects that entering level of basic skills and the curriculum play when student competence in these areas is measured after the equivalent of two full-time years of college. Specifically, the study addressed the following questions:

1. In predicting competence in reading, writing, and mathematics at the end of the sophomore year in college, what are the combined and independent effects of entering level of basic skills and the curriculum (defined as grades in required English and math courses, the length of time between the course and the test, and the number of credits in developmental courses)? Do findings differ significantly by ethnic membership?

2. What subset of basic skill test scores and curricular variables provides the best predictor of basic skills performance in reading, writing, and computation at the end of the sophomore year? Does this subset differ by ethnic group?

Methodology

Subjects

The database consisted of all Miami-Dade Community College students who took a sophomore test of basic skills for the first time during four administrations between the fall of 1984 and the fall of 1985. Based on self-report of ethnicity, three groups were formed consisting of 241 black non-Hispanic students, 591 white non-Hispanic students, and 1,401 Hispanic students. All students had entering basic skills scores and had completed the required English and math courses at Miami-Dade Community College.

Besides ethnicity, the groups differed in several ways. Black non-Hispanic students were somewhat older with a mean age of 23.7 compared

to 22.4 for white non-Hispanics and 21.3 for Hispanics. While 94% of the white students listed their native language as English, only 77% of the black non-Hispanics and 23% of the Hispanics did so. As a result, only 2% of white non-Hispanics had any English as Second Language (ESL) credits compared to 9% of black non-Hispanics and 11% of Hispanics. In other skill development areas, 40% of black students compared to 24% of Hispanic and 13% of white non-Hispanics had completed a developmental writing course. A similar pattern was found for the other two areas. In reading, 35% of blacks had credit compared to 16% of Hispanics and 8% of whites. The distribution was somewhat more even in math with credit earned by 32% of black non-Hispanics, 20% of Hispanics, and 17% of white non-Hispanics. The total sample consisted of more females than males (62% for black non-Hispanics, 57% for Hispanics, and 55% for white non-Hispanics).

Basic Skills Tests Variables

Entering levels of basic skills were measured using the reading, writing, and computation portions of the self-scoring Comparative Guidance and Placement Program (CGP), administered by the College Board. Reliability, as measured by KR20, was reported in the CGP manual as reaching .90 for Reading, .83 for Written English Expression, and .88 for Computation.

The CGP Reading test has 35 items and a standard error of measurement of 3.3. The CGP test of Written English Expression has 40 items and standard error of measurement of 3.9. The Computation test has 35 items and standard error of measurement of 3.0. In terms of predictive validity, the manual reported a media correlation of .28 between CGP Reading scores and subsequent English grades, a median correlation of .32 between Written English Expression scores and subsequent English grades, and a median correlation of .43 between math score and subsequent math grades.

Exiting levels of basic skills were measured using the College Level Academic Skills Test (CLAST). This test was constructed as a criterion-referenced measure with four sections: Reading, Writing, Computation, and Essay. The CLAST has been mandated by the State of Florida

for all college students at the sophomore level wishing to obtain an A.A. degree and/or move to upper division status. Students must pass all four sections of the test. The Reading test consists of 35 items and measures literal and critical comprehension skills. The Writing test has 34 items and measures word choice; sentence structure; and grammar, spelling, capitalization, and punctuation skills. The Computation test has 55 items and measures arithmetic, geometry and measurement, algebra, statistics (including probability), logical reasoning, and computer technology skills. On the essay, students are given 50 minutes to produce a product on one of two selected topics.

Using KR20, the reported reliabilities have varied from .82 to .87 in Reading, .68 to .77 in Writing, and .87 to .90 in Computation (College Level Academic Skills Project, 1983; Belcher, 1984). The reliability of the essay ratings was estimated using Coefficient Alpha; results have ranged from .76 to .89. The three multiple-choice portions of the test have been equated using Rasch modeling so that test scores vary from 100 to 400 with the mean fixed at 300 based on the results of the first administration. Essay scores are the result of the sum of holistic ratings on a 1-to-4 scale using two independent raters; scores can therefore range from 2 to 8.

The CGP and the CLAST are generally well-matched in the skills each purports to measure, especially in the areas of Reading and Writing. The Computation portion of the test is the least well-matched, with the CLAST Computation portion going well beyond the skills required by the CGP.

Curricular Variables

There are three courses related to the CLAST which all A.A. degree-seekers at M-DCC are required to take and pass with a grade of "C" or better prior to graduation. As will be noted from the following descriptions taken from the Miami-Dade 1985-87 Catalog, the courses parallel most of the competencies the CLAST is designed to measure.

ENC 1101 English Composition: A general education course to develop writing skills with application to a variety of informative and

personal contexts. It also provides instruction and application in active listening, efficient reading, and effective speaking skills.

ENC 1101 English Composition II: Focuses on composing informative and persuasive papers, writing responses to various kinds of reading, and producing a documented paper based on research. Prerequisite: ENC 1101.

MGF 1113 General College Mathematics: Addresses essential mathematical competencies at the levels of algorithmic processes, generalization, and problem solving within such areas as geometry, probability and statistics, algebra, computer literacy, and sets and logic. Completion of this course or demonstration of its competencies by testing is a requirement for the Associate in Arts degree.

The amount of time which lapsed between completion of these three courses and the CLAST was measured by counting the number of terms from course enrollment to taking the CLAST. Miami-Dade has four terms each year--two major semesters and two short summer terms. Therefore, the number of terms completed was divided by four to obtain an estimate of the number of years between course enrollment and the CLAST.

Students who enter M-DCC with deficiencies in reading, writing, and computations skills, as diagnosed by the CGP tests, are assigned to take developmental courses in the area. Many students, though not all who should, enroll and satisfactorily complete these developmental courses. The number of credits in developmental reading, writing, and computation was computed by adding the number of credits students completed with a "C" or better (or "S" in the case of pass/fail courses). Students who need to learn the English language are assigned to begin at one of four levels of work in English as a Second Language (ESL). The number of credits these students accumulated was also added to the data file. Any student who did not complete developmental or ESL credits was assigned a score of zero on these variables.

Data Analysis

The data was analyzed using multiple regression and the Statistical Analysis System (SAS). Using the stepwise procedure and the maximum R^2 improvement technique developed by James Goodnight, the best model was selected using two criteria: 1) The smallest C_p statistic (Mallows, 1964; Daniel & Wood, 1980) and 2) a resulting regression equation where the significance level of each variable included did not fall below an alpha level of .05. To answer the question on the need for separate equations by ethnic group, simultaneous testing of the hypothesis of coincidence of regression lines for ethnic groups was used. This is equivalent to testing the significance of the contribution of ethnic membership and all interaction terms to the prediction of CLAST scores given the basic skills and curricular predictors (Kleinbaum and Kupper, 1978).

Results

Table 1 displays all the descriptive statistics for the variables included in the analysis. You will note that black non-Hispanic and Hispanic students tended to have lower levels of entering basic skills as measured by the CGP, and perhaps as a result, had slightly lower grades in the courses included in the analysis. All three groups had about the same average number of years between course completions and the CLAST. Black non-Hispanic students also had accumulated more developmental credits in most areas.

Table 2 displays the correlation matrix for all variables included in the analysis. In most cases the highest correlation with CLAST scores was found for an entering basic skills test. In Reading, it was the CGP reading test. In writing and the essay, it was the CGP writing test. In computation, however, the highest correlation was found for math course grade and CLAST Computation score. In addition, there were also very strong correlations between reading and writing skills and CLAST performance in the computation area. Low to moderate negative correlations were found between CLAST performance and the number of credits completed in ESL and developmental areas.

In each of the four areas, the combined set of predictors significantly predicted CLAST performance (Reading: $F = 179.36$, $p = .0001$; Writing: $F = 102.75$, $p = .0001$; Essay: $F = 101.64$, $p = .0001$; Computation: $F = 134.57$, $p = .0001$, d.f. = 13, 2222). Inclusion of the ethnic membership variable and all of the interaction terms with ethnic membership did not improve the prediction significantly for any of the subtests but Computation ($F = 2.50$, $p = .01$, d.f. = 28, 2195). This finding indicates that a single equation can be used for all three ethnic groups in reading, writing, and the essay, but that separate equations will be needed in the computation area for the three groups.

Table 3 displays the proportion of variance accounted for by the full model and by the basic skills and curricular variables both alone and in combination. To aid in visualization, these results are also displayed in bar graph form in Figure 1. You will note that in the three communication areas, the strongest prediction by the model was found for Reading, where over 50% of the variability in Reading CLAST scores could be explained by the combination of variables included. However, over half of this predictability was due solely to the entering levels of basic skills that students brought with them to college. Almost all of the remaining proportion of the predictable variability was due to the interaction of entering level of basic skills and the curricular variables. On the multiple-choice Writing test and the Essay, the curricular variables played a somewhat stronger, though still small, role as an independent predictor of performance. In this case, most of the variability was explained by the interaction of entering level of basic skills and the curricular variables. Less that a third was due solely to the independent effects of entering level of basic skills.

Since previous analysis had indicated that separate equations were needed for the three ethnic groups in Computation, the results in this area are displayed separately for the three groups. Figure 2 visually depicts the results shown at the bottom of Table 3. Note that the largest proportion of variance could be explained for black non-Hispanic students, and the smallest proportion could be explained for Hispanics (.53 versus .38). Interestingly, the level of entering basic skills had the smallest

independent effect for black non-Hispanics (19% of the predictable variability) and the largest for Hispanics (31% of the predictable variability). Again, proportionally speaking, the curriculum had the largest independent effect for white non-Hispanic students. Overall, however, the curriculum when combined with the interaction with basic skills had the strongest impact on black non-Hispanic students. In general, the curriculum exhibited a much stronger effect on Computation than on any of the three communication subtests.

Just what subset of variables were the strongest indicators of performance in exiting basic skills? In reading, the stepwise prediction equation that best fit the criteria had six variables: entering level of basic skills in reading and writing, grades in the two English courses, time between the second English course and the test, and surprisingly, a grade in the general mathematics course MGF 1113. Entering level of reading received the heaviest weight. Use of this subset of six variables reduced only slightly the proportion of variance accounted for by the full model (less than .01). See Table 4 for full results.

In writing, a set of seven predictors was selected (see Table 5). The variable contributing the most weight was entering level of basic skills in writing. Again, grades in MGF 1113 as well as Computation basic skills also were included in the equation. Other variables included reading score and grades in the two English courses.

The six-variable stepwise regression selected for predicting CLAST essay scores also had an R^2 which was barely reduced from the full model (see Table 6). Again entering level of basic skills was a strong factor as well as grades in both English courses. For the first time a developmental variable was included: number of credits in ESL. This variable was negatively related to predicting CLAST essay scores indicating that the more ESL credits, the lower the essay score.

Table 7 lists the results of the stepwise regression for predicting computation for each of the three ethnic groups included in the analysis. For black non-Hispanics, a five-variable equation consisting of

computation and reading basic skills, grade in the mathematics course and the amount of time since the course, and grade in the first English course combined for the maximum prediction. The variable providing the most weight was grade in the mathematics course. For white non-Hispanic students, the six-variable equation contained similar types of variables, with grade in MGF 1113 receiving the heaviest weight. In this case, however, number of ESL credits was dropped and replaced with two measures of writing: entering level of basic skills and number of developmental writing credits. It is interesting to note that there was a positive relationship between the number of developmental writing credits and score in computation. For Hispanics, grade in MGF 1113 received the greatest weight. Also included were the number of developmental mathematics credits and the number of ESL credits, in this case both with a positive relationship to the predicted variable.

Discussion

Exiting level of basic skills in computation and communication can be predicted from the combination of entering level of basic skills and specific curricular measurements in this area. The weighting assigned to the two components differs by the area being measured and, in the case of computation, by ethnicity. In the area of communication, and especially in Reading, basic skills both alone and in interaction with the curriculum weighed heavily. In Computation, the curriculum was the strongest indicator of test performance, especially for black non-Hispanic students.

There are several possible reasons for these findings. One is that the area of mathematics consists of a more specific knowledge base with a set of answers which are clearly right or wrong. In addition, the CGP Computation test was less of a mirror image of the CLAST computation test than was true for either the multiple-choice reading or writing tests. Still, it could be argued that since more curricular variables were included under communication than math, a stronger showing in the area of the curriculum might have been expected.

Finding a need for different predictions by ethnicity in Computation but not communication was also a surprise. Given the

differences in level of entering basic skills and native language, the opposite had been expected. There is evidence that different predictions equations are usually needed when ethnicity is included in the analysis. Linn (1982), for example, concluded that this was the case but noted that the differences often were in the intercepts and not the slopes. This study did not check for intercept differences since the major thrust was explanation, not prediction.

Maspons and Llabre (1985) tested the assumption that Hispanic students were unfamiliar with the multiple-choice format. Using Miami-Dade students and the CGP Computation test, they concluded that training students in some test-taking strategies improved the prediction of their performance in the classroom. This could help in explaining why the proportion of variance accounted for by Hispanics was so much lower than that found for white or black non-Hispanics. However, one would expect the unfamiliarity with multiple-choice items to extend to the reading and writing tests as well.

The variables included in the stepwise regression should be interpreted with some caution since stepwise regressions are notoriously unstable in the variables to be included, and subsequently the weights assigned to each variable are unstable, too. Several conclusions, however, can still be drawn with confidence. One conclusion is that reducing the number of variables included in the analysis had little effect on the predictable proportion of variance. A second conclusion is that the abilities involved in communication and computation have a common underlying base. Prediction of CLAST reading, writing, and essay scores included both kinds of variables; the same was found in predicting CLAST computation scores.

Based on the stepwise regression analysis, it might also be concluded that developmental work contributed little to the prediction of later basic skills performance. Perusal of the correlation matrix, however, shows that the zero order correlations between number of credits in developmental reading and writing and CLAST scores were almost as high as the correlations of English grades with CLAST scores. The direction of the

correlations, however, were opposite. In all probability, therefore, the variability explained by the developmental and ESL variables was shared with entering basic skills scores and grades so the developmental variables had little unique variance to be included in the stepwise analysis.

These results have shown that students at Miami-Dade Community College are experiencing a "value-added" education that moves the student beyond the level expected from entering basic skills scores. This can be most strongly stated in Computation and least in Reading. This form of analysis could allow institutions to be compared on the impact of their curriculum while still accounting for different student bodies in terms of the basic skills they brought to the institution. Institutions could also use this process to monitor changes from year to year. In an era of increased concern with test results, such a process could provide a measure of quality control without sacrificing access to higher education.

Table 1

Descriptive Statistics for All Variables
Included in the Analysis

	Ethnic Categories					
	Black Non-Hispanic (N=243)		White Non=Hispanic (N=592)		Hispanic (N=1,404)	
Variables	Mean	S.D.	Mean	S.D.	Mean	S.D.
CGP Tests						
Reading	16.9	7.7	24.5	6.7	20.8	6.8
Writing	21.8	5.8	27.0	5.7	24.3	5.9
Computation	21.5	6.5	25.2	6.1	24.0	6.3
Course Grades						
ENC 1101	2.7	0.8	2.9	0.9	2.7	0.8
ENC 1102	2.6	0.9	2.9	0.9	2.6	0.8
MGF 1113	2.3	1.1	2.7	1.1	2.5	1.1
Years to CLAST Since Course						
ENC 1101	1.8	0.7	1.8	0.7	1.8	0.7
ENC 1102	1.1	0.7	1.2	0.7	1.1	0.7
MGF 1113	0.4	0.6	0.4	0.5	0.5	0.6
Developmental Credits						
Reading	1.3	1.9	0.3	1.1	0.5	1.3
Writing	1.4	2.0	0.4	1.2	0.8	1.6
Computation	1.0	1.5	0.6	1.3	0.6	1.3
ESL	2.0	7.6	0.3	3.0	2.4	8.0
CLAST Subtests						
Reading	285.6	27.6	310.2	27.9	297.8	27.1
Writing	293.0	27.0	312.8	30.2	303.2	28.9
Computation	294.9	27.1	321.1	28.0	310.2	26.9
Essay	4.0	1.5	4.8	1.3	4.4	1.4

Table 2

Correlation Matrix for All Variables Included in the Analysis

	CLAST				CGP			Time			Grade			Developmental			
	Reading	Writing	Computation	Essay	Reading	Writing	Computation	ENC 1101	ENC 1102	MGF 1113	ENC 1101	ENC 1102	MGF 1113	ESL	Writing	Reading	Math
CLAST Reading	-	51	45	46	68	58	28	05	05	-02	29	29	20	-21	-33	-31	-11
CLAST Writing	51	-	49	45	48	55	28	08	07	06	32	32	28	-18	-30	-23	-13
CLAST Computation	45	49	-	36	45	44	42	-01	-02	04	25	25	48	-12	-24	-24	-19
CLAST Essay	46	45	36	-	50	56	28	09	10	00	30	33	18	-26	-34	-24	-15
CGP Reading	68	48	45	50	-	69	32	14	15	00	27	28	17	-29	-41	-48	-17
CGP Writing	58	55	44	56	69	-	36	13	17	01	30	32	18	-32	-58	-36	-17
CGP Computation	28	28	42	28	32	36	-	04	02	13	12	15	23	-22	-21	-21	-57
Time ENC 1101	05	08	-01	09	14	13	04	-	61	21	01	06	-08	-20	-12	-02	-02
Time ENC 1102	05	07	-02	10	15	17	02	61	-	15	07	09	-10	-16	-13	-06	-02
Time MGF 1113	-02	06	-04	00	00	01	13	21	15	-	02	03	06	05	00	02	-12
Grade ENC 1101	29	32	25	30	27	30	12	01	07	02	-	35	23	-10	-17	-14	-06
Grade ENC 1102	29	32	25	33	28	32	15	06	09	03	35	-	26	-14	-17	-11	-07
Grade MGF 1113	20	28	48	18	17	18	23	-08	-10	06	23	26	-	00	-13	-07	-15
ESL Credits	-21	-18	-12	-26	-29	-32	-22	-20	-16	05	-10	-14	00	-	20	09	13
Developmental Writing	-33	-30	-24	-34	-41	-58	-21	-12	-13	00	-17	-17	-13	20	-	34	14
Developmental Reading	-31	-23	-24	-24	-48	-36	-21	-02	-06	02	-14	-11	-07	09	34	-	16
Developmental Math	-11	-13	-19	-15	-17	-17	-57	-02	-02	-12	-06	-07	-15	13	14	16	-

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Table 3
Unique and Combined Contribution of
(1) Basic Skills Scores and (2) Curricular Variables in
Predicting Exiting Levels of Basic Skills

	Proportion of Variance Accounted for By					
	Full Model ($R^2_{y.12}$)	Basic Skills Only ($R^2_{y.1}$)	Curriculum Only ($R^2_{y.2}$)	Unique to Basic Skills	Unique to Curriculum	Interaction of Both
Communication						
Reading	.5113	.4917	.2503	.2610	.0196	.2307
Writing	.3755	.3254	.2473	.1282	.0501	.1972
Essay	.3721	.3362	.2633	.1088	.0359	.2274
Computation						
Black Non-Hispanic	.5333	.3373	.4302	.1031	.1960	.2342
White Non-Hispanic	.4492	.2595	.3281	.1211	.1897	.1384
Hispanic	.3827	.2559	.2636	.1191	.1268	.1368

Table 4

Results of Stepwise Regression for Predicting CLAST Reading Scores

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	909663.23	151610.54	383.97	0.0001
Error	2230	880520.03	394.85		
Total	2236	1790183.26			

R^2=.5081

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	222.60				
CGP Reading	2.03	0.08	248669.08	629.78	0.0001
CGP Writing	0.91	0.10	33811.89	85.63	0.0001
ENC 1101 Grade	2.36	0.56	6979.45	17.68	0.0001
ENC 1102 Grade	1.86	0.56	4366.66	11.06	0.0009
Time since ENC 1102	-0.67	0.15	7759.65	19.65	0.0001
MGF 1113 Grade	1.02	0.41	2440.59	6.18	0.0130

Table 5

Results of Stepwise Regression for Predicting CLAST Writing Scores

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	7	734276.81	104896.69	189.86	0.0001
Error	2228	1230956.96	552.49		
Total	2235	1965233.77			

R^2=.3736

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	215.27				
CGP Reading	0.59	0.10	20763.65	37.58	0.0001
CGP Writing	1.70	0.12	115309.82	208.71	0.0001
CGP Computation	0.24	0.09	4260.22	7.71	0.0055
ENC 1101 Grade	3.83	0.67	18284.57	33.09	0.0001
ENC 1102 Grade	3.16	0.66	12604.22	22.81	0.0001
MGF 1113 Grade	3.48	0.49	27790.72	50.30	0.0001
Time Since MGF 1113	0.49	0.22	2816.12	5.10	0.0241

Table 6

Results of Stepwise Regression for Predicting CLAST Essay Scores

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	1582.52	263.75	219.51	0.0001
Error	2230	2679.52	1.20		
Total	2236	4262.04			

R^2=.3713

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	0.58				
CGP Reading	0.03	0.00	63.56	52.89	0.0001
CGP Writing	0.07	0.01	214.32	178.36	0.0001
CGP Computation	0.01	0.00	13.07	10.87	0.0010
ENC 1101 Grade	0.16	0.03	33.13	27.57	0.0001
ENC 1102 Grade	0.22	0.03	61.37	51.08	0.0001
ESL Credits	-0.01	0.00	14.30	11.91	0.0006

Table 7

Results of Stepwise Regression for
Predicting CLAST Computation Scores
by Ethnic Group

Black Non-Hispanic

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	5	91910.68	18382.14	51.26	0.0001
Error	236	84624.08	358.58		
Total	241	176534.76			

R^2=.5206

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	222.41				
CGP Computation	1.13	0.21	10890.88	30.37	0.0001
CGP Reading	0.94	0.17	10671.69	29.76	0.0001
MGF 1113 Grade	10.40	1.18	27949.32	77.95	0.0001
Time Since MGF 1113	-1.22	0.49	2181.01	6.08	0.0144
ENC 1101 Grade	3.58	1.54	1947.23	5.43	0.0206

Hispanic

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	384305.45	64050.91	142.27	0.0001
Error	1395	628056.98	450.22		
Total	1401	1012362.43			

R^2=.3796

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	226.77				
CGP Computation	1.07	0.12	37532.70	83.37	0.0001
CGP Reading	0.79	0.11	23386.01	51.94	0.0001
CGP Writing	0.73	0.13	14240.69	31.63	0.0001
MGF 1113 Grade	8.59	0.54	113620.28	252.37	0.0001
Dev. Math Credits	1.65	0.52	4457.38	9.90	0.0017
ESL Credits	0.21	0.08	3436.92	7.63	0.0058

White Non-Hispanic

	DF	Sum of Squares	Mean Square	F	Prob>F
Regression	6	205913.60	34318.93	77.84	0.0001
Error	585	257934.88	440.91		
Total	591	463848.48			

R^2=.4439

	B Value	Std Error	Type II SS	F	Prob>F
Intercept	222.67				
CGP Computation	1.12	0.14	25803.48	58.52	0.0001
CGP Reading	0.76	0.18	8017.93	18.18	0.0001
CGP Writing	0.93	0.23	6984.56	15.84	0.0001
MGF 1113 Grade	11.07	0.84	76955.86	174.54	0.0001
Dev. Writing Credits	1.92	0.85	2228.68	5.05	0.0249
Time Since ENC 1102	-0.83	0.30	3311.72	7.51	0.0063

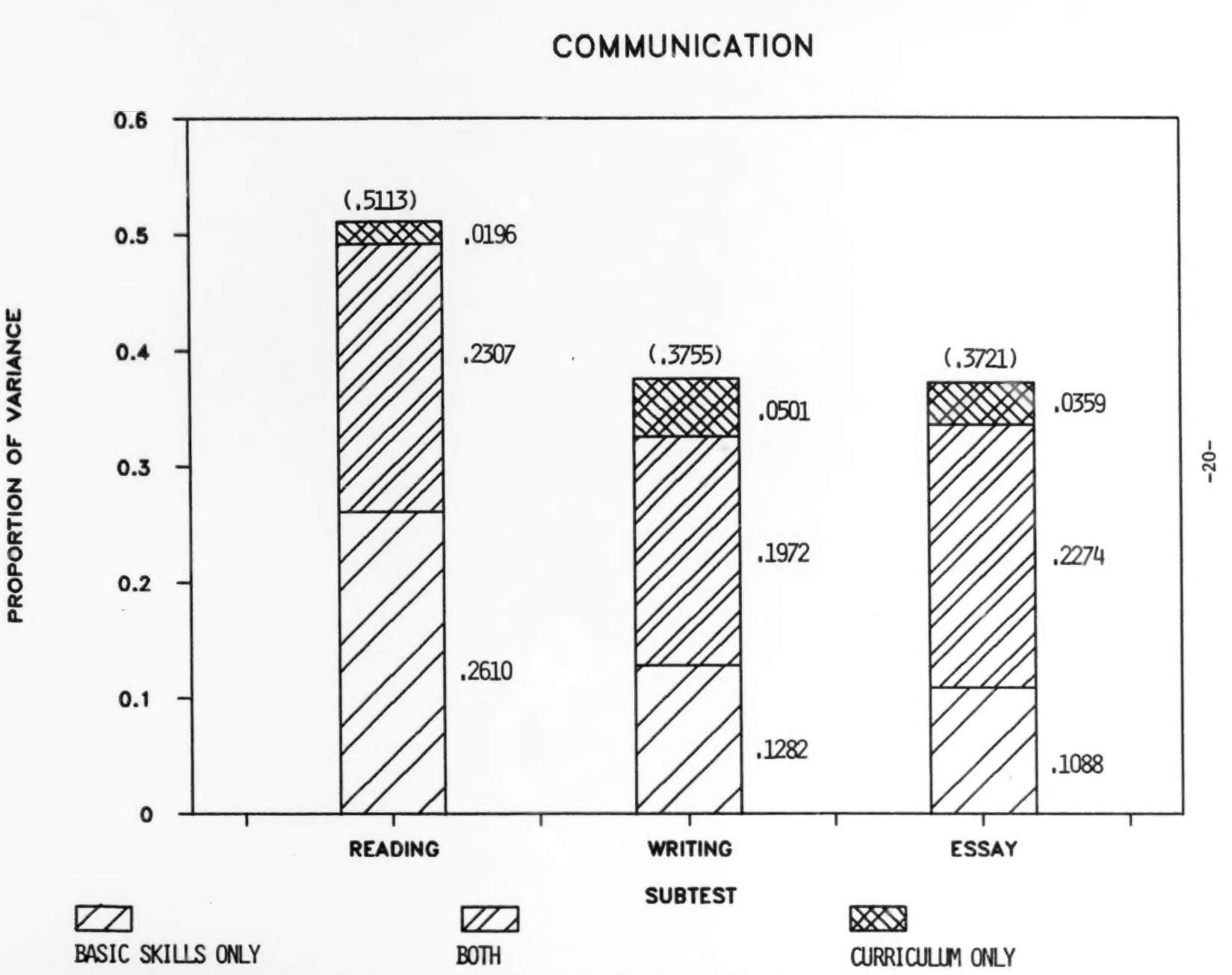

Figure 1. Contribution of entering basic skills and curriculum in predicting exiting level of communication basic skills.

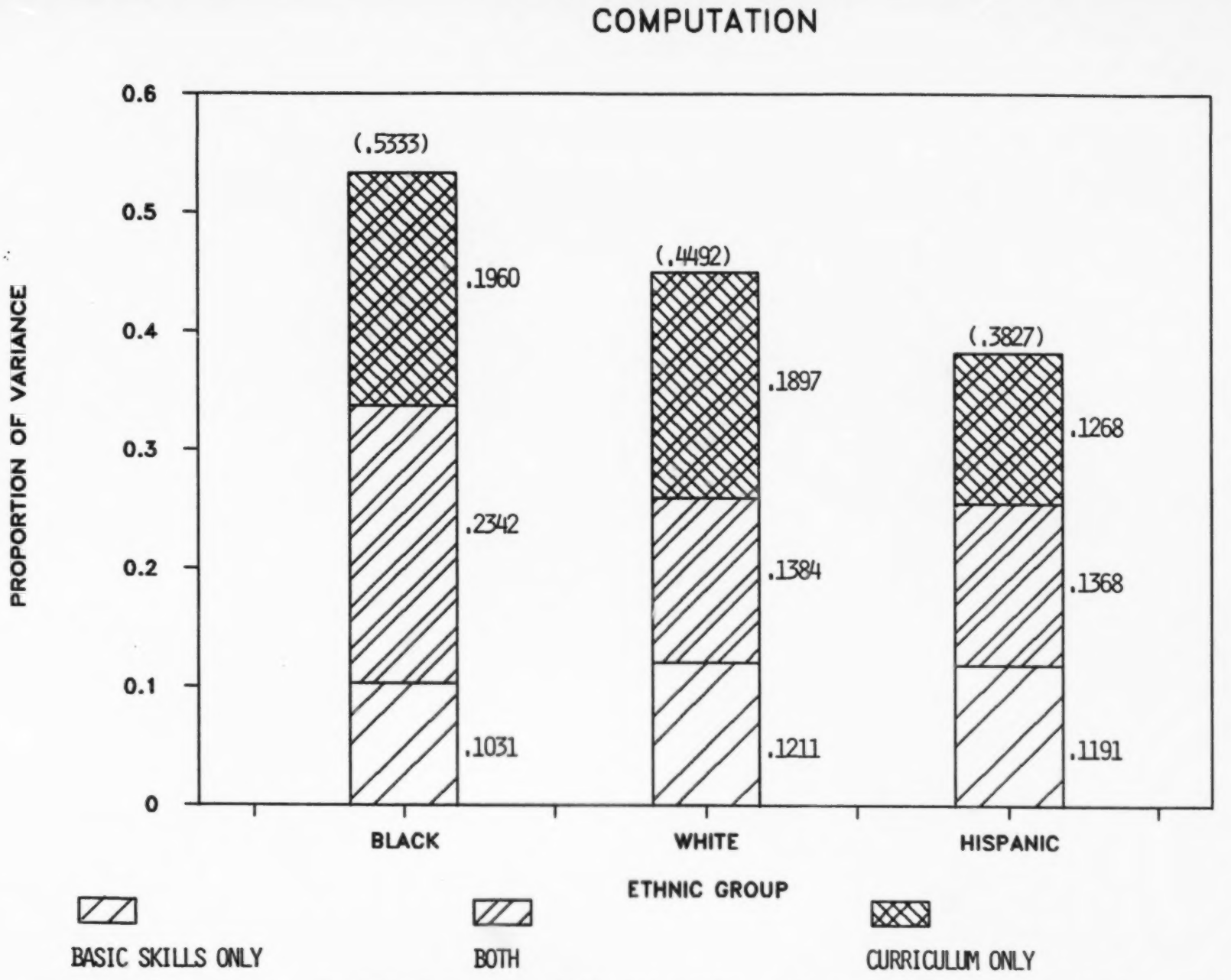

Figure 2. Contribution of entering basic skills and curriculum in predicting exiting level of computation basic skills.

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